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ABSTRACT

A study examined the effectiveness of a collaborative research and development project designed to enhance the academic competence of typically underserved minority students through instructional strategies which emphasize cooperative learning, maximize heterogeneous skill groupings, and focus on higher order thinking and communication skills. Subjects, 54 students from the primarily Hispanic Pajaro Middle School (California), participated in a year-long interdisciplinary, collaborative curriculum (developed by eight teachers and the University of California, Santa Cruz faculty) designed to maximize academic learning by integrating instruction in reading, writing, social science, and mathematics. Forty-eight students in the regular middle school program served as a control group. English speaking and bilingual students took the California Test of Basic Skills (CTBS) and the Language Assessment Scales Reading/Writing (LAS). Bilingual students were administered the Spanish Assessment of Basic Education (SABE). Results indicated that scores on the CTBS, LAS, and SABE were significantly higher for the project subjects than for non-project comparison group subjects on measures of reading comprehension, vocabulary, and writing. (Four tables and three figures of data are included; 20 references are attached.) (RS)

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AN ANALYSIS OF LITERACY ENHANCEMENT FOR MIDDLE SCHOOL HISPANIC STUDENTS THROUGH CURRICULUM INTEGRATION

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Abstract

The University of California, Santa Cruz, with the Pajaro Valley Unified School District, has participated in a collaborative research and development project. The project was conducted in the Pajaro Middle School, whose student population is 90% Hispanic (of which 60% are limited English speakers), with academic achievement 1-2 grades below statewide averages.

This project's theoretical and empirical foundations in cognitive science, language development, and effective schooling predicted that the academic competence of typically underserved minority students—like those in Pajaro Middle School—would be enhanced significantly through instructional strategies which emphasize cooperative learning, maximize heterogeneous skill groupings, and focus on higher order thinking and communication skills. The project worked to maximize academic learning by integrating instruction in reading, writing, social science, science, and mathematics.

The duration of the intervention was one academic year. Specifically, this intervention was expected to enhance student academic outcomes in reading and writing. Results of participating and non-participating comparison group achievement in these academic domains substantiate these expectations. Scores on the English CTBS, LAS, and, Spanish SABE were significantly higher for the project students than for non-project comparison group students on measures of reading comprehension, vocabulary and writing. Specific principals of curriculum and instruction which might account for these differences are discussed.

There is little need to document the U.S. educational system's failure to secure the academic success of California's minority students: 40-60% of Hispanic students do not complete high school. Recent studies (Garcia, 1983; Garcia, Lomeli, and Ortiz, 1984; Matute-Bianchi, 1986; Garcia, 1988) indicate that several factors bring about this regrettable state of affairs. Research on the effective instruction of minority populations —and Hispanic students in particular– has yielded conceptual knowledge which could be included in a practical, multi-faceted instructional plan to enhance the academic learning of minority students at the middle school level (Garcia, 1988; Moll, 1988). Specifically, this research utilized this new knowledge base and brought together university faculty and middle school administrators and teachers to implement a restructuring in grade seven. The project incorporated instructional strategies including heterogeneous groupings (limiting present "level/tracking" practices) and an integrated curriculum with an emphasis on higher order cognitive and linguistic skills across reading, writing, mathematics, science and social studies.

Background of the Study

For Hispanic and other minority students, little is known of the factors which result in "successful" or "effective" education at levels beyond elementary school (Carter and Chatfield, 1986). During the past twenty years, however, researchers have compiled a significant body of data on school attributes of effective schools which serve minority students (Purkey and Smith, 1983). With respect to instructional strategies, studies of effective schooling have yielded findings relevant to Limited English Proficient (LEP) students (Tikunoff, 1983; Wong-Fillmore *et al*,. 1985; Carter and Chatfield, 1986), minority

students in general (Edmunds, 1979; Chall and Snow, 1988), and Hispanic students in particular (Garcia, 1988). Although these recent findings require additional empirical augmentation, the present study brought together university faculty and seventh grade teachers to design and implement an instructional intervention to enhance academic learning opportunities for Hispanic "at-risk" students, which was based on these preliminary findings.

The project's approach incorporates instructional strategies (listed below) which have been demonstrated as effective in promoting the linguistic minority student's literacy, mathematics, and English language development in school. Because the proposed project was concerned, ultimately, with "students learning how to learn", particular significance was assigned to strategies, drawn from cognitive science and effective schooling research which support the achievement of basic skills and the acquisition of higher-order linguistic and cognitive processes, and use linguistic, analytical, cognitive, and metacognitive processing to maximize academic learning.

Strategy #1: Use of a thematic, integrated curriculum, such that academic objectives are achieved through content-integrated instruction;

Strategy #2: Emphasis on small group activities incorporating heterogeneous language grouping and peer tutoring, and emphasizing higher order linguistic and cognitive processes (in which learning proceeds from the concrete to the representational and then to the symbolic);

Strategy #3: Emphasis on literacy activities: interactive journals, silent reading followed by small group discussion, interactive literature study, individual and group-authored literature, and mathematics logs;

Strategy #4: Use of cooperative learning strategies, emphasizing the systematic participation of each student in processing curriculum materials.

Procedures

For an academic year, the project reorganized the seventh grade instructional environment at the participating middle school for fifty-four students. Specifically, an instructional intervention was implemented for two heterogenous groups of approximately thirty students each. One group was made up of English Only (EO) and reclassified Spanish/English bilingual (BIL) students in the seventh grade, while the second group included EO and Fluent English Proficiency (FEP) with higher level BIL students who were near the transition level or were already in transition English reading. These students were together in four of six periods with the same classmates.

Eight teachers worked collaboratively with UCSC faculty to implement an interdisciplinary, collaborative curriculum for these two groups (THEME) students). The content area subjects taught were reading, language arts, science, mathematics, and social studies (science was taught for one semester and social studies for the other). The two groups of students were integrated with other students from the rest of the school for two periods a day, during which they were enrolled in physical education and an elective.

A Comparison group was established consisting of 48 students in the regular middle school program. These non-THEME students changed classes throughout the day and experienced six different combinations of students from six different non-integrated content area subjects.

Recall that the THEME students were heterogeneously grouped in two strands, one bilingual and one English only, in which they remained through math, reading, language arts and social studies/science (these flip-flopped mid-year). Within the first week of

school, the THEME group instruction began using the Olympics as the first thematic unit. Using that theme as a springboard, the four content areas were taught. The teachers met in order to share their individual areas of curriculum focus within the Olympic theme and to integrate lessons across the curriculum.

The eight Pajaro School staff and University faculty met weekly during lunch at the school site. The purpose of those meetings was to briefly share, up-date and relate pertinent information, for example: needed resources and materials, student involvement, the theme's progress, assessment scheduling, classroom visitations, planning collective field trips, parent meetings and other business relative to the project.

The overflow of business and actual instructional/collaborative planning time was handled during monthly release time meetings. The Pajaro staff and UCSC faculty met to review teaching issues, share assessment data and basically expand on the actual mechanics of the project. These meetings provided the needed additional time to problem solve concerns and to build collaboratively, instructional strategies and actual lessons that crossed the content areas.

Organizing the meetings, facilitating and handling project business was delegated to the project's half-time site coordinator, who also taught one of the classes in the two strands. The Coordinator maintained communication between the University and Pajaro Middle School, arranged field trips, substitute scheduling, ordered materials, disseminated information, arranged instructional support, dealt with problems that arose and served as the project's contact person.

At the end of the project's second theme, the Arts, a parent potluck with student presentations took place. This provided an opportunity to involve and further inform parents about the project. The staff was available to present rationale and answer

questions. Students presented a description of their THEME classes and shared completed projects.

In summary, THEME students were placed in heterogeneously structured learning groups which attempted to maximize effective communication and learning. Comparison group students followed the "traditional" curriculum and scheduling program. THEME project students participated in a core integrated curriculum whose intent it was to increase opportunities for language and literacy development. The integrated instruction was organized around themes. The themes for the academic year were: 1) the Olympics; 2) the Fine Arts (Popular Music, Art and Fashion); 3) the Ocean; 4) Crime. Students and teachers together selected these themes. Students worked in collaborative learning groups characterized by academic heterogeneity and an orientation to positive interdependence.

Results

The following analysis was specifically conducted to address the academic achievement effects of the previously described instructional intervention in the domains of language, reading and writing. Academic achievement measures in English and Spanish were obtained for the various groups of the study during the Spring semester of the academic year. For English-only and bilingual students in the THEME group and the Comparison group, six subtests of the English version of the California Test of Basis Skill (CTBS) along with seven subtests of the English version of the Language Assessment Scales Reading/Writing (LAS) were utilized for this analysis. The Subtests for the CTBS included:

1. Vocabulary
2. Language Mechanics
3. Reading Comprehension
4. Reading Total
5. Language Expression
6. Language Expression Total

The subtest on the LAS included:

1. Synonyms
2. Fluency
3. Antonyms
4. Mechanics and Usage
5. Reading for Information
6. What's Happening
7. Let's Write

For LAS subtests 1-5, multiple choice items were presented to students while in subtests 6 and 7, students were requested to write a description of a scene and/or create a description of their own identified scene. In addition, bilingual students were administered two subtests of the Spanish Assessment of Basic Education (SABE):

1. Vocabulary
2. Reading

Figure 1 presents the mean raw scores for the THEME bilingual group, THEME English-only group and the Comparison English-only group on the six subtests of the English CTBS. On each subtest, the THEME English-only group performed higher on these measures of academic achievement. Moreover, the THEME bilingual group did not differ significantly from the English-only comparison group on any of these measures. The theme Bilingual group had been identified by their need for further academic development and was made up of English dominant students who participate in bilingual classrooms with their Spanish dominant peers. It was academically significant that this group did not differ from a group of English-only curriculum students.

Figure 2 presents the mean raw scores for the THEME bilingual group, the non-THEME bilingual group, the THEME English-only group and the non-THEME English-only group on the seven subtests of the English LAS. Results indicate that THEME groups consistently performed higher on these measures than their appropriate Comparison group cohorts. This is particularly the case for bilingual students. On six of the seven subtests, THEME bilingual students scored significantly higher than Comparison bilingual students. Of particular interest were the significant differences found between these groups in the 6th and 7th subtest which obtain a measure of written language ability.

Figure 3 presents the mean raw scores of the THEME bilingual group and the non-THEME bilingual group on the two subtests of the SABE. Differences on these measures favor the THEME bilingual group on each of these measures.

Tables 1, 2 and 3 present the means and standard deviation for each group for English CTBS subtest, English LAS subtests and Spanish SABE subtests, respectively. These means were subjected to a series of independent t-test analysis for each of these subtest measures. This analysis produced a pattern of significant difference ($p < .05$) which are evident in Tables 1-3 and Figures 1-3. Specifically, on CTBS subtests, THEME

English-only students significantly outscored both THEME bilingual and non-THEME English-only students on four (Vocabulary, Language Expression, Language Expression Total and Reading Comprehension) of the six subtests. No significant difference were found between THEME bilingual and non-THEME bilingual students on these CTBS measures. On the LAS subtests, a pattern of significant results favoring the THEME groups was also identified. On six of the seven subtests, THEME bilingual students significantly outscored non-THEME bilingual students. Only on subtest 4, Mechanics and Usage, was this not the case. Similarly, THEME English-only students significantly outscored non-THEME English-only students on four (Synonyms, Antonyms, Mechanics and Usage and Reading Comprehension) of the seven subtests.

On Spanish measures, a pattern of differences favoring THEME group students was found. This difference was not statistically significant on the SABE Vocabulary subtest. However, this difference was statistically significant for the SABE Reading subtest.

In summary, the results of the above analysis indicate a consistent pattern of achievement outcomes which favor the THEME group students. This consistent pattern was evident for bilingual as well as English-only THEME group students.

Discussion

This study follows the pattern of recent efforts to enhance the collaboration between researchers and teachers to "restructure" present curriculum in behalf of students who have historically been unsuccessful in school. The present effort brought together middle school teachers with university faculty in a redesign of seventh grade curriculum and instruction. This redesign was founded on recent empirical work which has identified "effective" instructional and curriculum with Hispanic students along with recent theoretical formulations which are of general relevance to enhancing academic learning. THEME students participated in an educational experience which kept them together for the majority of their school day. This experience included participation in small heterogeneously structured learning groups through which instruction was delivered around jointly determined themes which integrated reading, language arts, math, science and social studies. The academic outcomes of these THEME students were compared to a group of students who participated in this same school's seventh grade "typical" organization: seven independently taught, homogeneously-leveled classes with limited curriculum integration with more traditional "whole" group instructional approach.

The implementation of the project required extensive "rethinking" of the existent middle school organization by teachers, administrators and participating university faculty. Moreover, the restructuring which took place required extensive collaboration, especially by the teachers. These teachers report that without the time the project allowed them to meet and plan, the project would not have been possible. In addition, they report that the on-site coordinator played a key role in bringing them together and insuring that the goals and specific objectives of the project were always at the forefront of the project activity. Recall that the teachers were provided with a minimum of one-day release each four to six

weeks and met on a weekly basis during lunch. The coordinator was able to have the time to meet individually with teachers and university faculty and was a key resource person with regard to developing and/or "finding" relevant theme related curriculum material. In sum, the project could not have been implemented without the additional release time for teachers and the presence of an effective site coordinator.

The results of the project are clearly positive. That is, consistent positive comparative academic outcome data favor the student participants of the THEME intervention over the "conventional" program implemented at this middle school. Specifically, comparative analyses in the areas of reading comprehension, vocabulary, language mechanics and language expression in English significantly favored the THEME students. Similar results were found on Spanish measures. Although these "empirical" results are promising, it is important to identify a number of constraints of the study. First, the study was a voluntary effort by a group of self-selected and particularly motivated teachers and university faculty. Coupled with the inability of the present project implementation and data procedures to specify specific causal links between the intervention subcomponents and the dependent variables, the results of the study are difficult to specifically interpret. It does seem appropriate, however, to conclude that the results suggest a "set" of possible school and classroom restructuring alternatives that may provide enhanced educational successes for a population of educationally vulnerable students.

With the present results and implementation experiences of this study in mind it seems appropriate to readdress the set of principles with which this study begun. Table 4 attempts to summarize this set of principals, particularly as they relate to the diversity of the student population which more and more teachers are serving. Diversity in language and culture are becoming all to common place in today's classrooms. The present project

was designed with such a circumstance in mind and attempted to directly address this challenge. As Table 4 indicates, developing and implementing the curriculum and instruction for diverse student classrooms requires attention to curriculum comprehensiveness, quality and integration. In addition the instructional strategies utilized in such situations should emphasize small group interaction, heterogeneous grouping, and active/informal learning activities of vertical and horizontal relevance. Based on the tentative results of this study, these principles seem to carry significant promise for further educational research and educational change.

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TABLE 1

Means and Standard Deviations of English
CTBS Subtests by Group

CTBS

Group (N)		Vocabulary	Language Mechanics	Reading Comprehension	Reading Total	Language Expression	Language Expression Total
THEME BILINGUAL (17)	M	22.0	16.7	24.6	47.8	26.1	42.6
	S.D.	3.1	3.6	4.1	5.2	3.1	4.1
THEME ENGLISH-ONLY (26)	M	27.4	19.9	29.4	51.7	33.6	52.1
	S.D.	2.6	3.1	3.1	4.1	3.2	4.4
NON-THEME ENGLISH-ONLY (31)	M	22.9	17.5	24.8	50.7	27.6	45.0
	S.D.	3.6	3.2	3.1	5.3	3.8	4.2

TABLE 2

MEANS AND STANDARD DEVIATIONS OF ENGLISH LAS READING AND WRITING SUBTESTS BY GROUP

GROUP (N)		Synonyms	Fluency	Antonyms	Mechanics & Usage	Reading for Information	What's Happening	Let's Write
THEME BILINGUAL (21)	M	8.4	8.4	8.4	13.1	14.0	12.1	4.3
	S.D.	2.1	1.6	2.5	2.4	2.5	3.6	.7
NON-THEME BILINGUAL (14)	M	6.6	5.6	5.4	11.8	5.6	8.2	3.0
	S.D.	1.9	1.3	1.1	2.3	1.1	2.1	.5
THEME ENGLISH-ONLY (26)	M	9.5	8.9	9.2	14.2	9.1	11.6	3.8
	S.D.	2.3	2.0	2.0	3.1	2.1	1.6	.5
NON-THEME ENGLISH-ONLY (31)	M	6.3	8.1	7.5	12.6	7.2	11.8	4.0
	S.D.	1.0	1.1	2.0	3.0	1.6	1.8	.6

TABLE 3

MEANS AND STANDARD DEVIATIONS OF SPANISH SABE SUBTESTS BY GROUP

GROUP (N)		VOCABULARY	READING
THEME BILINGUAL (22)	M	34.2	28.0
	S.D.	3.6	3.4
NON-THEME BILINGUAL (14)	M	31.8	24.8
	S.D.	3.9	4.1

TABLE 4

CURRICULUM PRINCIPLES FOR 'DIVERSE' STUDENT POPULATIONS

Any curriculum, especially one for "diverse" children, must address all categories of learning goals.

The more "diverse" linguistic and culturally the children we teach, the more content must be related to the child's own environment and experience.

The more "diverse" the children, the more important it is for the content, knowledge and skills to have horizontal relevance.

> Vertical relevance is preparation for the next stage of life.
> Horizontal relevance means that the knowledge and skills are relevant to the child's everyday life.

The more "diverse" the children, the more the curriculum should address learning through active endeavors rather than passive ones.

> First had experiences are major sources of learning.

The more "diverse" the children, the more important it is for the curriculum to offer opportunities to apply what they are learning in a meaningful context (worksheets are not meaningful).

The more "diverse" the children, the more likely it is that excessive practice and drill will endanger the dispositions to use them.

The more "diverse" the children, the larger the proportion of time that should be spent on informal activities, particularly group work on projects.

The more "diverse" the children, the more integrated the curriculum should be. children should have opportunities to study a topic in depth, to apply all kinds of skills they have acquired.

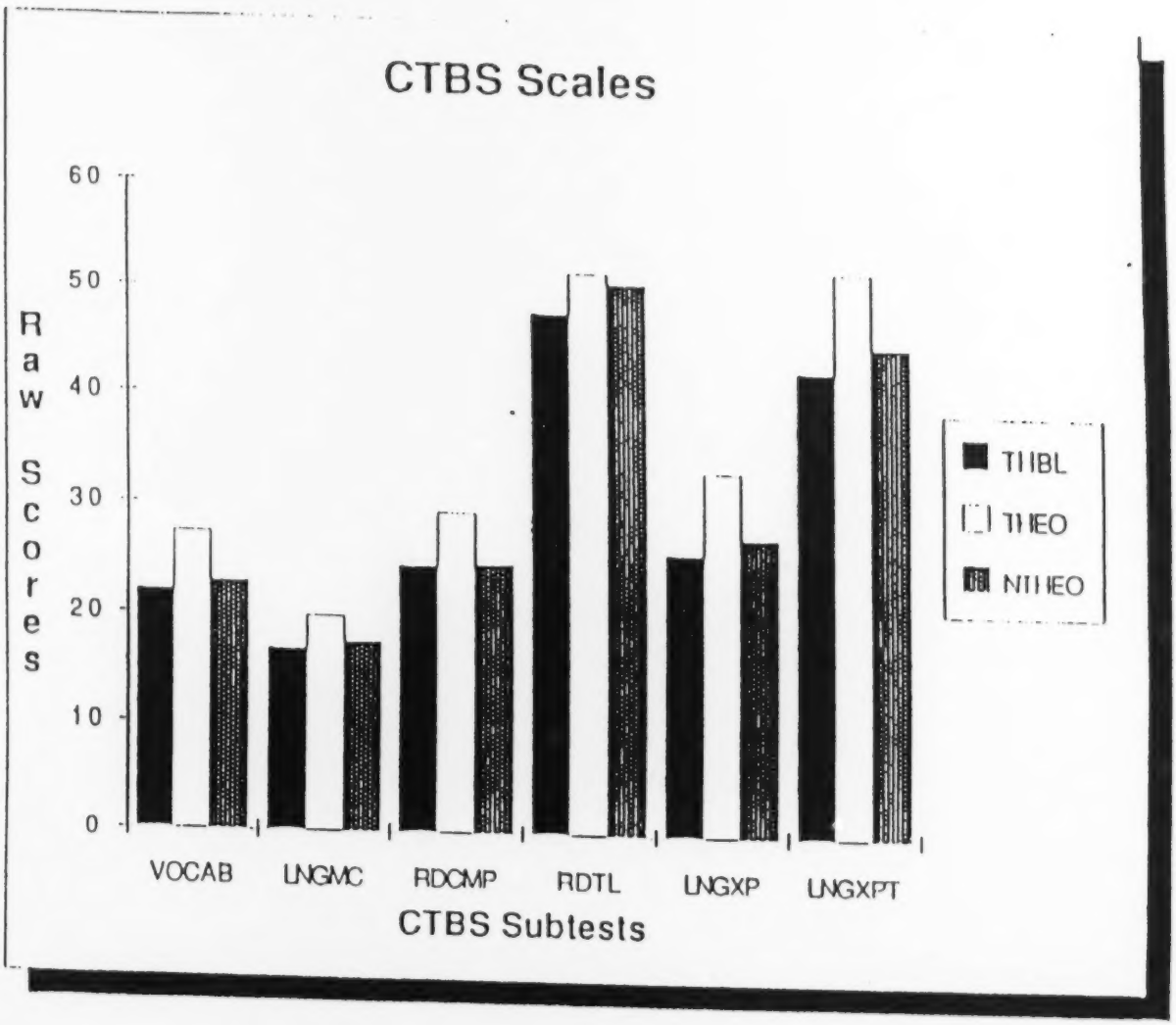

Figure 1.

Mean Raw Scores for Bilingual Theme (THBL), English-Only THEME (THEO) and English-Only Non-THEME (NTHEO) students on the Vocabulary (VOCAB), Language Mechanics (LNGMC), Reading Comprehension (RDMCP), Reading Total (RDTL), Language Expression (LNGXP), and Language Expression Total (LNGXPT) subtests fof the CTBS.

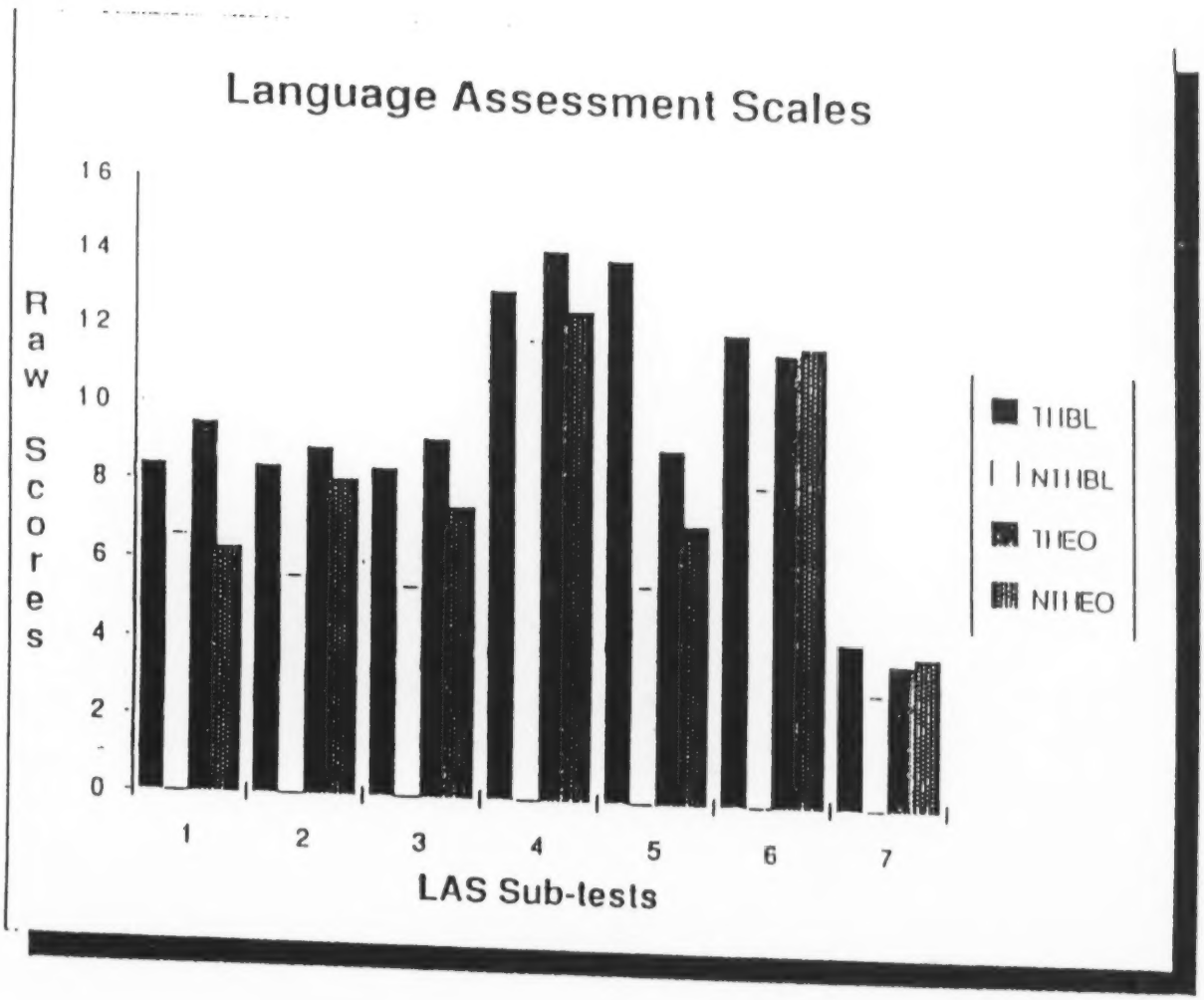

Figure 2.

Mean Raw Scores for the Bilingual Theme (THBL) Bilingual non-THEME (NTHBL), English-Only THEME (THEO) and English-Only non-THEME (NTHEO) students on the seven sub-tests of the English Language Assessment Scales.

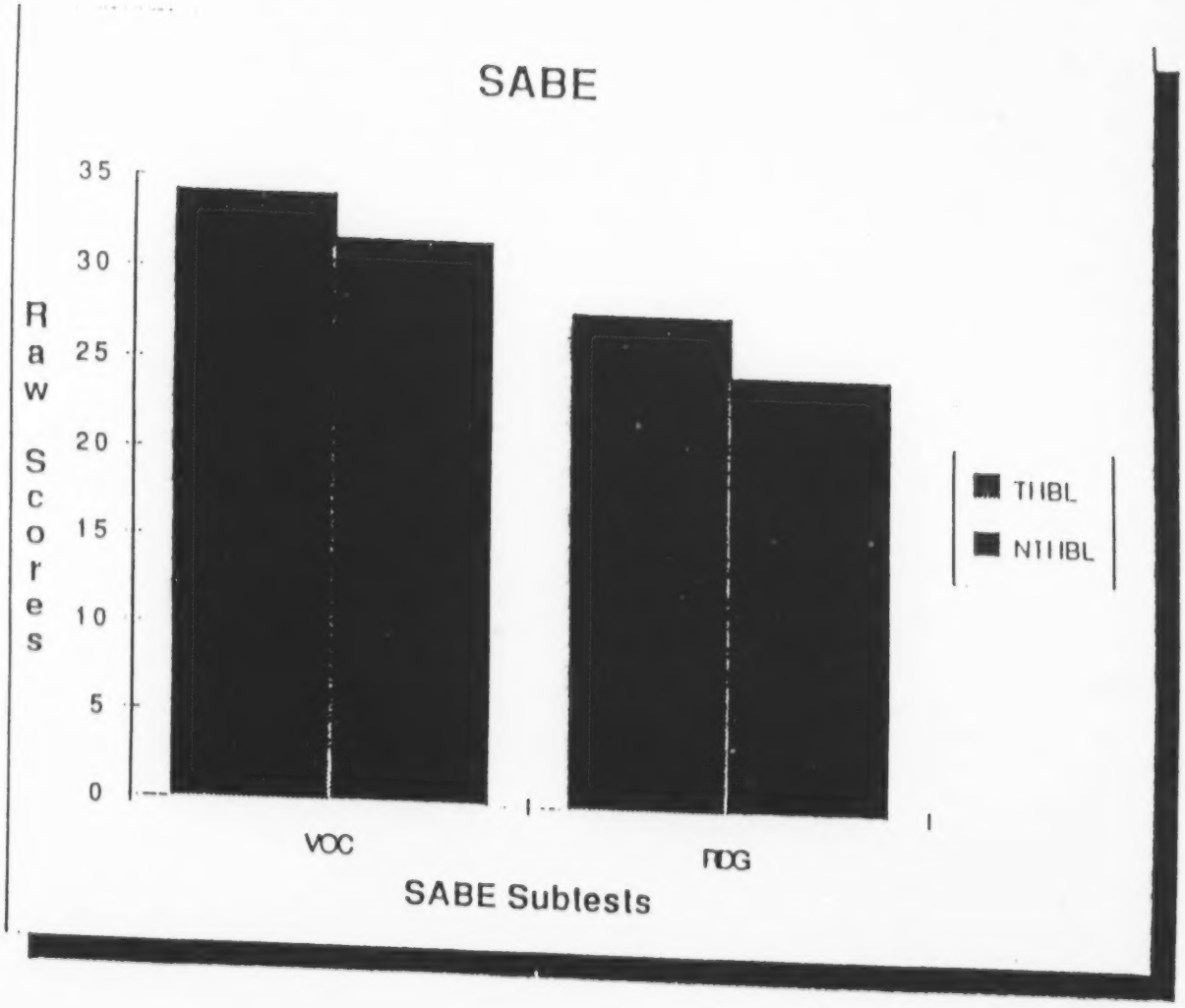

Figure 3.

Mean Raw Scores for Bilingual THEME (THBL) and Bilingual non-THEME (NTHBL) students on the SABE Spanish academic achievement subtests of Vocabulary (VOC) and Reading (ROG).